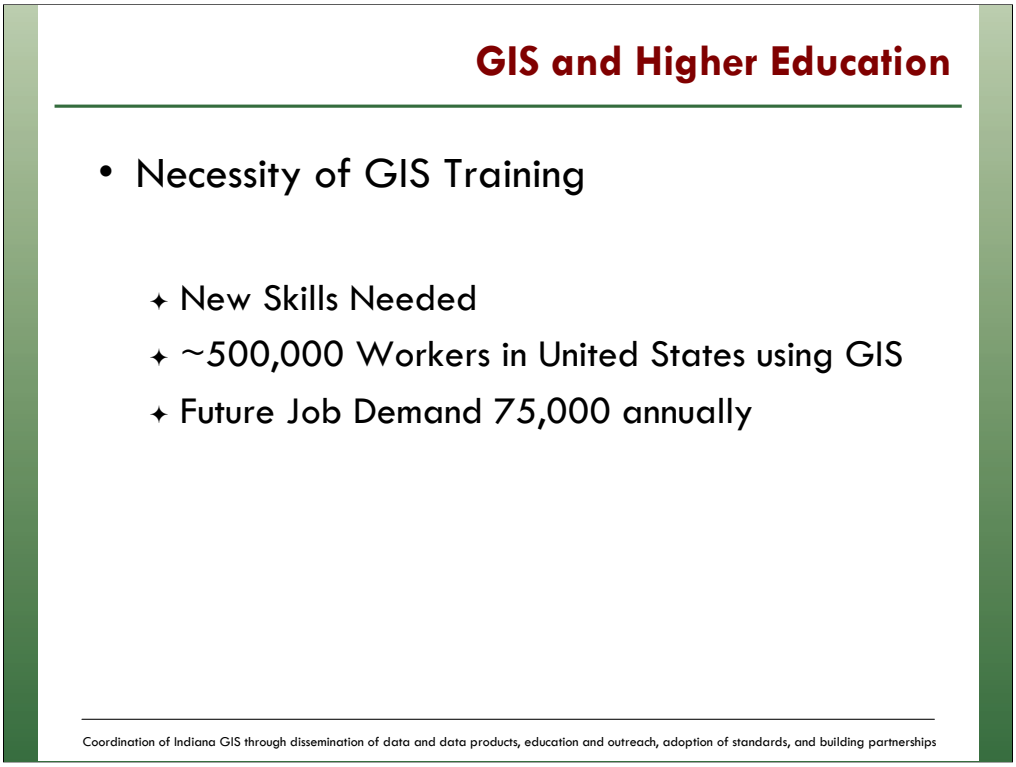
GIS in Higher Education

Indiana
GEOGRAPHIC INFORMATION
COUNCIL



•The Explosion of GIS technology has created a demand for a workforce with appropriate skills

•GIS provides the tools to view and analyze all kinds of spatial related data

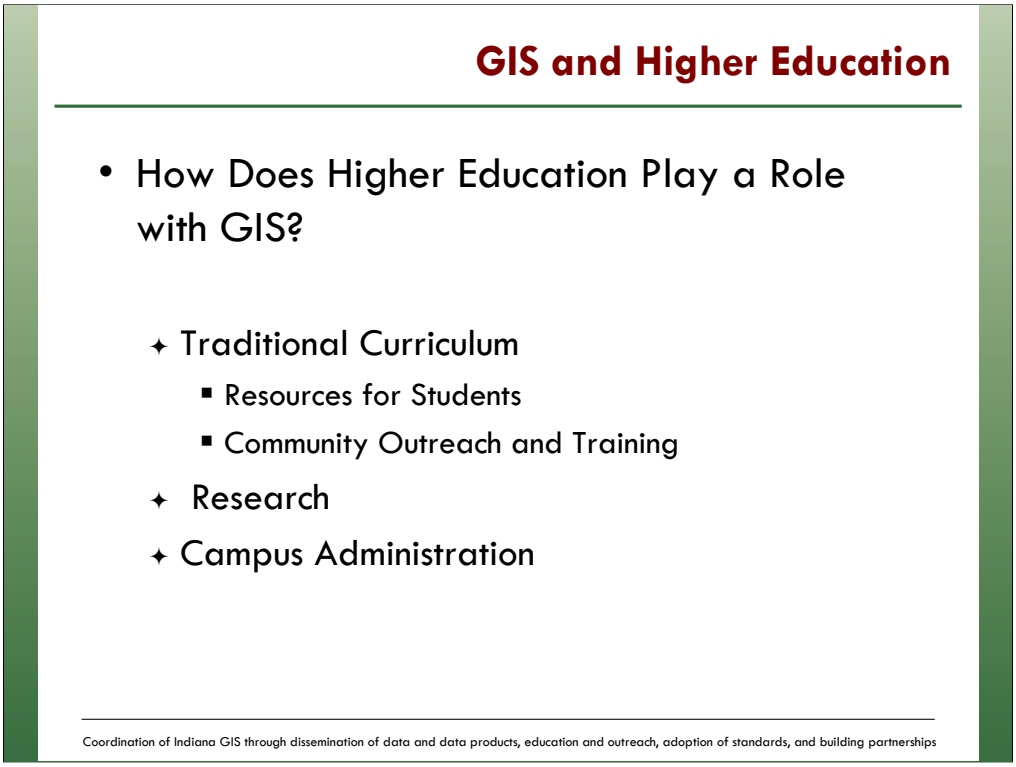
•Knowledge of GIS provides training for many careers

•The number of personnel in US using GIS as part of their jobs is approaching 500,000

•Most of these workers will have training through only one college course

•Demand will increase for those with additional GIS training

•As the technology has expanded, so have the number and diversity of companies that demand GIS capabilities. Such industries include real estate firms, insurance companies, food distributors, and casinos -- all applying GIS solutions to logistics, marketing programs, and supply chain issues.



Each of these areas will be investigated more thoroughly in upcoming slides.

•Students in many disciplines around the world are introduced to geographic data daily. GIS Specific Programs exist at all levels – Associate degrees and technical certificate to graduate level programs are available. (See IUPUI website: http://www.iupui.edu/%7Egeotech/)

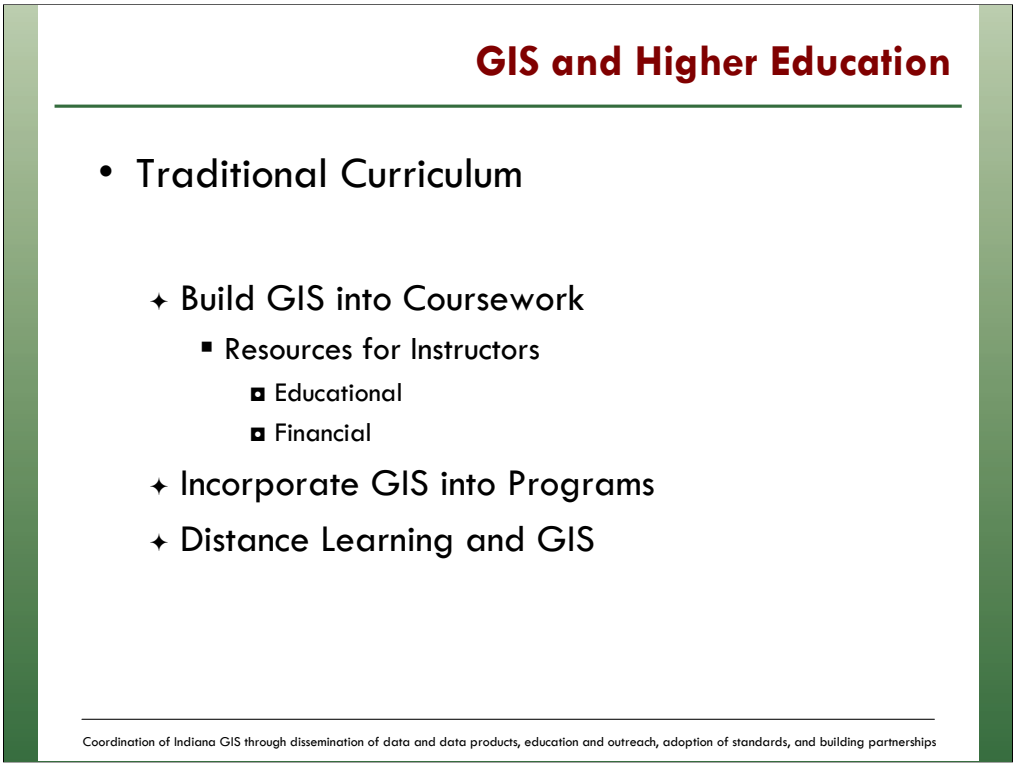
•Student internships are often available in the field due to local demand for such skills in most communities.

•Many GIS Software companies provide license agreements to educational institutions. With multiple licenses of GIS software, computer labs can be provided for teaching and research activities.

•Colleges and Universities also often provide GIS training through short courses and workshops to the community through Continuing Education Departments.

•GIS is being used as a methodology application in a variety of faculty/student research projects.

•University staff are using GIS for campus projects as well.



Build into Coursework

GIS undergraduate course work in geography generally includes a general introduction to the subject.

•Initial natural fit with Computer Information Systems and Geography

•GIS incorporated into coursework enhances logical, mathematical, linguistic, spatial and interpersonal activities

•It is a natural addition to science course work

•Also wonderful tool for non science subjects such as business

•GIS is also being incorporated into many areas of study besides geography including:
Business, Education, Public and Environmental Affairs, History, Anthropology, Law Enforcement Programs, Biology, Engineering

•Masters Degree programs may include GIS related coursework such as Advanced Quantitative Geography, Advanced Remote Sensing, Geographic Visualization Methods and Spatial Modeling.

•Plenty of GIS Educational opportunities exist for instructors. GIS conferences geared specifically towards education are available through software vendors. Participation in state and national GIS organizations also provide support and educational opportunities. Local GIS Users groups provide close-to-home expertise with personnel currently at work on local projects.

•Possibilities for GIS course funding:

•Colleges and Universities often provide internal funding for new course development.

•Projects including GIS components can be proposed to a variety of organizations

Incorporate into Programs

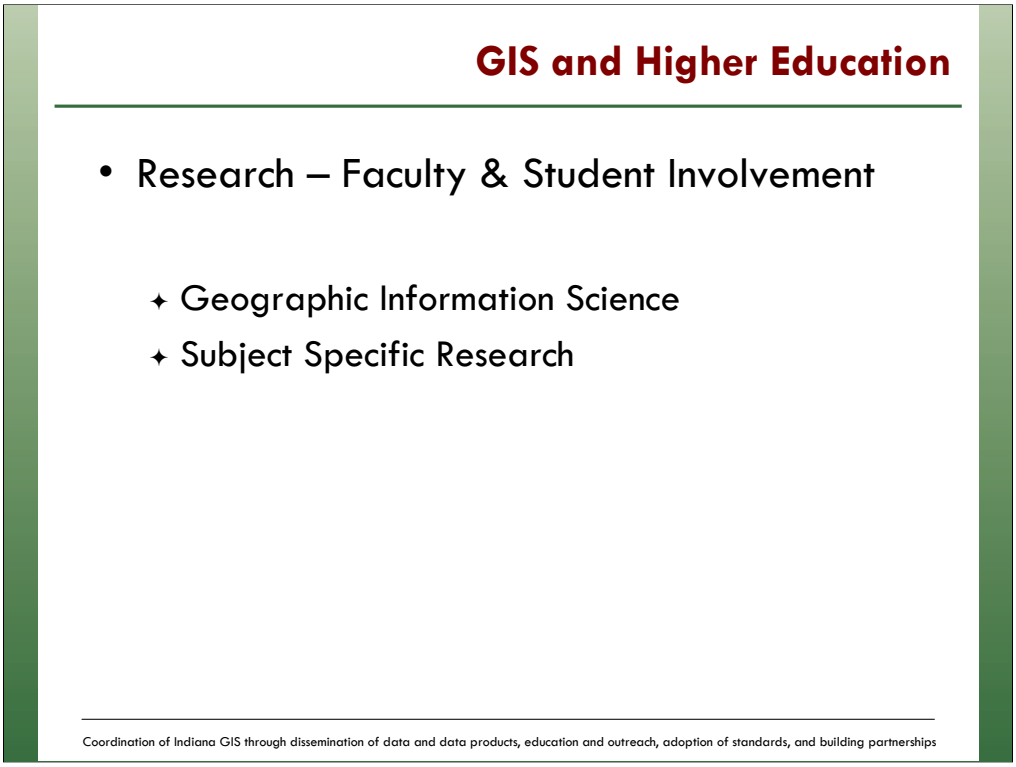
•Traditional graduate programs in GIS may require prerequisites prior to enrollment. Specific degree programs may require fulfillment of designated GIS coursework. Students may also be required to demonstrate competence in a research technique or complete a thesis beyond the GIS coursework requirement.

Distance Learning

•Online GIS Certificate programs exist to acquire cutting-edge skills that you can immediately apply in the workplace. The certificate program allows study on your own schedule, where and when it's most convenient for you.

•Rather than just putting their regular classes online colleges and universities have developed courses specifically designed for the needs of the working professional.

•The Louisiana Tech GIS Certificate Program is a series of four GIS courses delivered over the internet leading to a GIS certificate of accomplishment. You do not get college credit for these courses, so you do not have to be accepted into the university and pay university fees. The courses are designed to help professionals expand their GIS knowledge while working at home or in the office. The courses are self-paced, allowing students to adjust their work according to the demands of their office. Lessons are worked in order of the course syllabus, but no due dates are set. The faster you do the lessons, the sooner you get the certificate. You have up to nine months to complete each course.



Faculty in various disciplines are currently utilizing GIS in their research projects.
By providing GIS software training, faculty can include students in their projects.
Students can also include GIS research projects as part of their course work.

Geographic Information Science:

> Geographic Information Science involves research both "on" and "with" spatial technologies including geographic information systems (GIS), remote sensing, and the global positioning system (GPS). At the core of GIScience is the integration of these technologies and their application to problems of spatial analysis. The scientific use and study of methods and tools for the capture, storage, distribution , analysis, display and exploitation of geocoded information. The fundamental theory and principles of GIScience are based in the discipline of Geography. However, virtually all fields (from engineering, to medicine, science, business, social sciences and humanities) are now embracing GIScience in both theoretical and applied research.

Subject specific examples:

Anthropology:

GIS and GPS technologies are used to map the archaeological sites locations of civilizations to study ancient habitat use. Employing remote sensing to aid in the identification of prehistoric and historic sites.

Geography:

GIS applications for assessing the robustness of local food systems and the accessibility of nutritious, local, and sustainably grown food within communities

Education:

GIS as an educational tool - Development of materials, methods, and curriculum to support the process of teachers and students using GIS together to study their world

Geology:

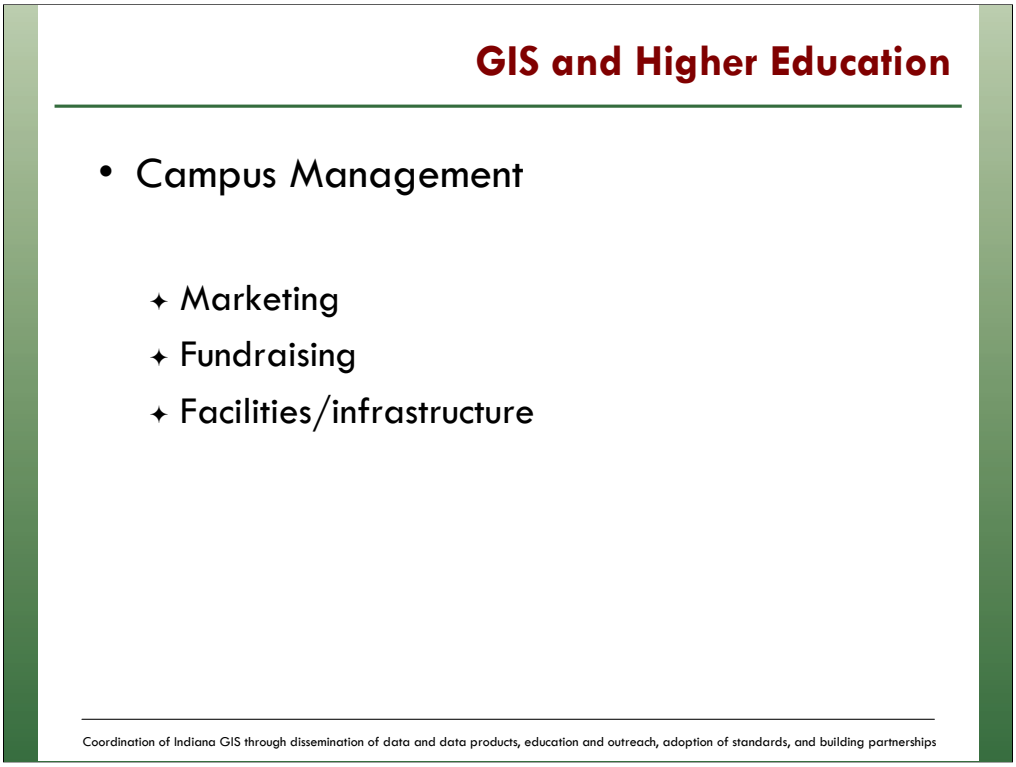
Research currently underway at Indiana University Northwest in Gary, IN involving geoscience students: The study of sand dune migration over time and how it is affected by Indiana Dunes National Park visitors.

Urban Planning:

Urban Forest planning and management

Business:

Leveraging GIS-enabled Processes into the Market Research Analytics



GIS can be used to search potential donors needed for special funding issues. Using the proper database, businesses can be targeted within a specific distance from campus.

Facilities managers have maintained CAD-based maps of their campuses for many years, but now they are using GIS to add intelligence such as room capacity, available times and technology infrastructure, to make better use of campus facilities.

As in other disciplines, GIS can be utilized for campus planning issues, managing telecommunications and utility networks.

GIS and Higher Education

- Higher Education GIS Resources
  - ESRI – GIS for Higher Education
    http://www.esri.com/industries/university/index.html
  - Status of GIS Education: The Higher Education Institutions in the United States
    http://gis2.esri.com/library/userconf/proc02/pap0790/p0790.htm
  - Mapalytics – Tailored for the Education Community
    http://www.mapalytics.com/gis_fhe.htm
  - National Institute for Technology and Liberal Education - Transformations - Managing and Supporting GIS in Higher Educational Contexts
    http://www.nitle.org/index.php/nitle/transformations/2006_5_1